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STAFF APPRAISAL REPORT

KOREA

VOCATIONAL EDUCATION PROJECT

FEBRUARY 15, 1991

Country Department II
Asia Regional Office

CURRENCY EQUIVALENTS

Currency Unit - Korean Won (W)

US$1.00 = W 710
(February 1991)

WEIGHTS AND MEASURES

Metric System

FISCAL YEAR

January 1 - December 31

ACADEMIC YEAR

March - February

ABBREVIATIONS

BE	- Board of Education
EFB	- Education Facilities Bureau
ELPD	- Education Loan Projects Division
ICB	- International Competitive Bidding
KEDI	- Korea Educational Development Institute
KVTMA	- Korea Vocational Training and Management Agency
MOE	- Ministry of Education
O&M	- Operations and Maintenance
OSROK	- Office of Supply, Republic of Korea
PCR	- Project Completion Report
PPAR	- Project Performance Audit Report
STD	- Science and Technical Division
TRC	- Technical Repair Center
VED	- Vocational Education Division
VET	- Vocational Education and Training
VHS	- Vocational High School
VTI	- Vocational Training Institute

KOREA

VOCATIONAL EDUCATION PROJECT

Table of Contents

The report is based on the findings of a preappraisal mission which visited Korea during February - March 1990 and an appraisal mission consisting of Messrs. W.E. Rees (mission leader), S.Z. Sung and J.J. Stewart (consultants), which visited Korea during June 1990. Peer reviewed were Messrs. G. Hunting (AS5PH) and R. McGough (ASTPH). The documents were reviewed by Messrs. Bradley O. Babson, Chief, AS2PH), and Gautam S. Kaji, Director, AS2.

Table of Contents (Cont'd)

KOREA

VOCATIONAL EDUCATION PROJECT

Loan and Project Summary

Borrower	:	Republic of Korea
Beneficiaries	:	Selected vocational high schools
Amount	:	US$30.0 million equivalent
Terms		Repayable in 15 years including 5 years of grace at the Bank's standard variable interest rate.
Project Description	:	The overall objective of the project is to assist in upgrading the skill training provided in selected vocational high schools to ensure that their graduates continue to meet the increasingly complex skill requirements in industry, commerce, agriculture and fisheries. The project would assist in making vocational school graduates more productive upon entering employment and better able to adjust to changing technological processes. The project would include specialized equipment to be financed by the Bank (US$30.0 million including contingencies) for technical, commercial, agricultural and fisheries/marine vocational high schools. The Government would finance complementary inputs related to making the equipment operational and maintaining it thereafter, namely transportation and installation costs, O&M and consumables (US$13.3 million).
Benefits and Risks:		The project would provide selected vocational high schools with modern equipment which would be closely attuned to the increasingly complex equipment utilized in the industrial, commercial, agricultural, and fisheries sectors. This would result in improved training which would enhance the value of vocational high school graduates to prospective employers by increasing their usefulness immediately upon graduation and by improving their ability to adjust to technological change in the workplace. Thus, the continued employability of vocational high school graduates would be assured, and the productivity of the sectors in which the graduates were employed would be enhanced. There are no major risks associated with the project.

Project Costs:

	Local	Foreign	Total
	(US$ million)		
Technical Schools	5.4	15.8	21.2
Commercial Schools	2.2	6.6	8.8
Agricultural Schools	1.3	3.8	5.1
Fisheries Schools	0.4	1.3	1.7
Baseline Cost	9.3	27.5	36.8
Contingencies			
Physical	0.5	1.4	1.9
Price increase	1.9	2.7	4.6
Subtotal	2.4	4.1	6.5
Total Project Cost /a	11.7	31.6	43.3

Financing Plan:	Local	Foreign	Total
	(US$ million)		
Government	11.7	1.6	13.3
IBRD	-	30.0	30.0
Total	11.7	31.6	43.3

Estimated Disbursements:

Bank FY	1992	1993	1994	1995	1996	1997
Annual	2.0	10.0	10.0	6.0	1.5	0.5
Cumulative	2.0	12.0	22.0	28.0	29.5	30.0

/a Does not include duties, taxes and fees estimated at US$2.3 million.

Economic Rate of Return: Not applicable.

Map: IBRD No. 22680

KOREA

VOCATIONAL EDUCATION PROJECT

I. VOCATIONAL EDUCATION AND TRAINING IN KOREA

A. Introduction

1.1 Investment in education and training at all levels has played a prominent part in Korea's remarkable growth over the past three decades. As the economy expanded and changed structurally, the education and training system adjusted accordingly to keep pace with these changes. In the 1960s when economic development was based largely on labor-intensive light industries (textiles, footwear, etc.), the demand for highly skilled workers was relatively modest and the major need was for developing the basic education and skills of a rapidly expanding workforce. Thus priority was given to the expansion of primary and lower secondary education with the result that universal primary education was achieved by 1970 and lower secondary for all by the late seventies. With the shift towards development of heavy and chemical industries in the 1970s and the increasing export orientation of industry in general, the demand for skilled workers increased rapidly and greater attention was given to vocational education and training. As industry evolved towards increasingly technology-intensive production and high export volumes in the 1980s, skill requirements became increasingly complex and fast-changing and more emphasis was therefore placed on improving the quality of skills training. At the same time, high technology development required an expansion of training of scientists and engineers with the result that the 1980s saw a rapid growth of enrollments in science and technology programs in the universities, especially at the graduate level.

1.2 Skilled workers or craftsmen occupy the base of the skill pyramid supporting technicians, trained in the junior colleges and engineers and technologists who are university-trained. In Korea, a distinction is made between vocational education and vocational training although both systems produce skilled craftsmen. Vocational education is undertaken in public vocational high schools (VHSs) which are part of the public secondary education system (along with general high schools) under the overall direction of the Ministry of Education (MOE). Private VHSs receive some financial support from, and are closely regulated by, MOE. Selected VHSs will be assisted under the proposed project. VHS students continue their general education while pursuing vocational specializations. Vocational training institutes (VTIs), which may be public or private, provide more narrowly-based skill training to school-leavers. Graduates of both types of institutions must take the same skill proficiency tests to qualify as an entry-level (Class II) craftsman. Employers regard the VHS graduate as having more broadly-based skills compared to the more narrowly-focussed VTI graduate and the VHS graduate is often thought to be more flexible in fields where technology is changing rapidly and retraining needs are frequent.

1.3 In terms of the overall demand for craftsmen, the shift noted above towards more capital and technology-intensive production has retarded the

growth of craftsman training while raising the demand for post-secondary technical skills. The output of craftsmen from the VTIs peaked in 1979 when it reached 129,000 and has since shown a downward trend to the output level of 57,900 in 1989. Enrollment growth in the vocational high schools which started to taper off in the early 1980s, peaked at 917,000 in 1986 and had declined to 835,000 in 1989. This demonstrated that the vocational education and training (VET) system is to some degree responsive to market signals and is not as inflexible as VET systems in many countries, which continue to produce graduates irrespective of declining or changing demand in the labor market. However, the decline in VHS enrollments has also been influenced by the discontinuance in 1984 of the preference given to VHS graduates who applied to colleges and universities to continue their specializations at the higher level.

B. Vocational Training Institutes

1.4 The Government led the way in establishing vocational training in Korea under the first Vocational Training Law of 1967. This law resulted in the establishment of the first public VTIs. As the demand for skilled workers increased, the growth of public VTIs could not keep pace and the Government therefore decided that the private sector should become an important provider of vocational training. The Government also recognized that industry-based training was likely to be more adaptable to changing skill needs than training provided in formal institutions which by their nature were further removed from the labor market. Training subsidies were introduced to encourage private firms to undertake training and these were replaced in 1974 by mandatory training requirements (para. 1.9). These policies have determined the present structure of vocational training in Korea which comprises public sector VTIs and private sector in-plant training institutions and institutions "authorized" by the Government to provide training. The latter include training in office-related skills.

1.5 Public vocational training programs are from one to three years duration while private in-plant training lasts from 6 to 12 months and private authorized training from 3 to 6 months. The vocational training system comprised 261 centers in 1989 with an output of around 57,900 craftsmen.1/ The public sector accounted for 74 institutions with an output of about 22,100 craftsmen which represents about 28% of the training institutions and 38% of output. Public sector training is undertaken in centers managed by central government departments and local government bodies but the most significant organization is the Korea Vocational Training and Management Agency (KVTMA). It was established in 1982 to centralize the administration of public vocational training institutions and to manage such central functions as textbooks and curriculum development, skills testing for both the public and private sectors and the preparation of skill and industry-specific demand projections. KVTMA controls 33 VTIs which account for about 70% of the public

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1/ In addition, 700 master craftsmen, 140 instructors and 4,435 supervisors were trained in the system which also provided upgrading training to 16,230 workers already in employment.

sector training output. The structure of craftsman training in the VTIs is outlined in Annex 1.

1.6 KVTMA centers traditionally drew their trainees from middle-school graduates and high school dropouts. However, with the achievement of almost universal progression from middle to high school, increasing numbers of trainees are being recruited from among high school graduates who have followed the general education curriculum and are seeking skill training to improve their prospects of employment. Training expenses are met by the Government with the exception of a nominal charge for room and board which may be waived in cases of economic necessity. The curriculum is about 30% theoretical and 70% practical for the technical skills programs. The theory element breaks down into about 7% spent on general subjects to 23% on technical subjects. The practice element comprises basic practice (20%) and major practice (50%). Graduates of the programs usually achieve skill certification at the Class II craftsman level. Graduates from the KVTMA centers enjoy very high pass rates in national skill tests and similar rates of employment on graduation--about 95% in both cases.

1.7 The training of craftsmen in the VTIs is focused strongly on training for the metal processing, transport and construction equipment, and electronics and communications industries. Taken together, these industry groups accounted for about 50% of the total output of craftsmen in 1989. On the other hand, output from courses serving textiles and wood processing accounted for only 12% of total outputs (Annex 2). This contrasts with the structure of craftsman training during the Fourth Five-Year Plan (1977-81) when outputs of craftsmen for metal processing, transport and construction equipment, and electronics and communications were only 39% of total outputs while craftsmen trained for textiles and wood processing accounted for 40% of total outputs. This reflects how the structure of craftsman training has changed in response to the changing nature of Korean industry which increasingly has moved away from relatively labor-intensive, low-skill industries such as textiles towards heavy industry and technology-intensive fields such as electronics and communications.

1.8 The private sector is responsible for the major effort in vocational training, accounting for 62% of the output of trained craftsmen in 1989. This represents a significant shift in private sector training which accounted for only 52% of training output in 1983. This trend reflects the Government's policy of shifting increasing responsibility to the private sector which can more effectively identify skill needs and provide training more efficiently than public sector institutions.2/ Large firms invest heavily in skill training and maintain well-managed, generously-funded training centers. Such individual centers account for about two-thirds of in-plant training. However, smaller firms lack the resources to establish training programs and, with lower skill needs, such programs are often not practicable. They therefore share training costs with groups of similar firms or rely on recruitment

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2/ Lee, Chingboon, "Financing Technical Education in LDCs: Economic Implications from a Survey of 1985 Training Modes in Korea, World Bank Discussion Paper, September 1985.

in the market or directly from the public sector institutions. About 60% of the graduates of KVTMA training institutions are recruited by small and medium firms.

1.9 The shift of training efforts to the private sector disguises the fact that in-plant training of craftsmen has declined in recent years. The growth in private sector training has been in the "authorized" training institutions which focus mainly on office-related skills. Authorized training produced around 6,500 craftsman-level workers in 1983 and this had grown to 19,500 in 1989, reflecting strong growth in the services sector of the economy. In the same period, outputs of craftsmen with technical skills from in-plant training institutions declined from around 21,000 to 16,300. This downward trend reflects the failure of the Government's long-term priority to boost in-plant training. When training subsidies were offered during 1968-71, training efforts increased but immediately declined when the subsidies were removed. In 1974, the Government made in-plant training of a certain percentage of employees (about 6.5% in the beginning but later reduced) mandatory for firms with over 500 employees (later reduced to 200). In 1976, a training levy was introduced to be paid by all firms subject to mandatory training which did not carry out this training. The proceeds of the levy are placed in the Vocational Promotion Fund which supports public sector vocational training.

1.10 The levy system has not been particularly effective in promoting in-plant training. Bureaucratic regulations involving the preparation and approval of training schemes made the levy system cumbersome, time consuming and expensive from the employer's point of view. Furthermore, the levy was determined annually on the basis of relative training costs in each industry. Cost data proved difficult to compile and keep up to date with the result that the levy fell well short of the actual cost of training. Thus many smaller employers found it cheaper to pay the levy, forego training and recruit in the labor market. Thus the levy came to be treated as just another business tax. The Government has adjusted the levy amount to cover a greater proportion of training costs--in 1986 the levy was raised to a level which covered about 75% of the cost of training. This compared with a 25% coverage in 1979. The levy has been relatively unsuccessful because large firms were motivated to undertake training regardless of the levy while smaller firms found it insufficient as an incentive to encourage training. Recently, the Government simplified the levy from an amount based on training costs to a payroll tax. This obviates the need to produce an annual survey of training costs for each industry but the impact of this change on the amount of training provided is not yet apparent.

C. Vocational High Schools

1.11 Secondary education in Korea comprises two streams - general and vocational - both of three years' duration (grades 9-12). General high schools are academically oriented and aim largely at preparation for higher education. Vocational high schools aim at continuing general education to grade 12 while at the same time providing sufficient vocational education to permit graduates to find employment in their fields of specialization. In 1989, enrollments in general high schools were about 1,491,000 and in

vocational schools, around 835,000. Entry to both streams is based on scholactic record in junior high school, interviews and the results of entry tests.

1.12 Structure and Enrollments. The VHS system comprises several different types of schools. "Vocational" schools offer training in only one skill; "comprehensive" schools teach one or more skill and also have general secondary courses; "technical" schools (formerly called "engineering" schools) teach industrial skills with strong emphasis on machinery, electricity, electronics and engineering drawing; "commercial" schools focus mainly on clerical, secretarial, information processing and accounting; "agriculture" schools emphasize agriculture, horticulture and animal husbandry; and "fisheries and marine" schools focus on fishing, fish breeding, marine engine maintenance and navigation/communications. Enrollments in 1989 in the different types of schools are as follows:

Table 1.1: ENROLLMENTS IN VOCATIONAL HIGH SCHOOLS (1989)

Type of School	Enrollments ('000) Total	Female	% Female	% by Type
Commercial	377.2	297.4	78.8	45.2
Technical	197.1	3.2	1.6	23.6
Comprehensive	187.4	116.4	62.1	22.4
Agricultural	44.4	5.2	11.7	5.3
Vocational	19.2	12.5	6.5	2.3
Fisheries and Marine	9.9	0.2	2.0	1.2
Total	835.2	434.9	52.1	100.0

1.13 Overall, females accounted for about 52% of total enrollments in 1989 and are heavily concentrated in the commercial schools and in office-related courses in the comprehensive schools. Details of enrollments by course and sex are given in Annex 3. About 97% of total female enrollments are in commerce, information processing, accounting and secretarial courses and the remainder mainly in horticulture. Females comprise 75% of total enrollments in these courses. This largely reflects the traditional preference of female students for office-related courses rather than technical skills courses and this bias seems to have strengthened even more as the services sector expanded rapidly in recent years. In 1982, 95% of total female enrollments were in commerce, secretarial and related courses.

1.14 Vocational high schools can also be classified by the type of organization that operates them namely public, private or national. The system of 588 schools is structured as follows:

(a) 312 public VHSs (with total enrollments of 316,100) are operated under the general supervision of provincial or city boards of education;

(b) 273 private schools (512,600) operated by individuals or under the supervision of corporations; and

(c) three national schools (6,450) which are centers of excellence under the direct supervision of the Vocational Education Division (VED) of MOE.3/

1.15 Management. There are three key levels in the management of the VHS system. First, the Ministry of Education (Annex 4) is responsible for the allocation of budgetary resources through the local education boards (para. 1.16). MOE also exercises overall control over standards in both public and private schools. The latter include prescribed standards for equipment, teacher qualifications, curricula, student/teacher ratios etc. Second, local administration of the system is the responsibility of nine provincial and six city boards of education. Working within MOE-prescribed standards and procedures, the boards have the authority to allocate budgetary resources to schools and audit their accounts, set enrollment targets, appoint, assign and transfer teachers, plan and implement in-service teacher training programs, review the performance of schools etc. In respect of these activities, both public and private schools generally receive similar treatment. Third, individual schools are responsible for the selection of students (within the targets set by the boards), scheduling of classes, maintenance of building and equipment. Private schools are also able to recruit teachers directly subject to their meeting MOE-specified qualifications.

1.16 The key management agency is the board of education (BE) (Annex 5) because it has direct responsibility for implementing MOE's policies and also for applying its standards and guidelines to school operations. From the perspective of the proposed project, the BEs are key agencies in the selection of participating schools and in the identification of equipment requirements. Boards of education have mostly elected members and have powerful staffs which are headed by superintendents who are also board members. Superintendents are appointed by the President and carry a rank equivalent to vice-minister. This is an indication of the status and authority of the boards. The administration of VHSs is the responsibility of the Science and Technical Division (STD) of the School Affairs Bureau of the BE. Staffing of a STD varies in size but typically it has around 10 senior education supervisory staff (usually former school principals) who undertake a major review of the performance of public and private schools every 2-4 years. Formal procedures exist for resolving any problems highlighted during school performance reviews culminating in direct intervention by the BE in the operations of delinquent schools. The decentralized management system is effective largely because the BEs have been

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3/ The three national VHSs are public technical schools which were set up by presidential decree. As centers of excellence they are better endowed than the average VHS in terms of equipment, teachers and overall resource allocations.

delegated major responsibilities by MOE and have the prestige to attract able and influential people as members. The quality of the boards' staff is generally high and this leads to effective support for, and supervision of, individual schools.

1.17 Financing. The vocational high schools are financed mainly by budgetary allocations in the form of grants-in-aid and by tuition fees. In the case of private schools, endowments also provide some income. A relatively small contribution is also made by parent and teacher associations. Grants-in-aid are provided by MOE to the education boards on the basis of standardized unit costs for different types of schools and enrollment levels. The boards of education then allocate resources to each school based on a budget the school has prepared. Grants-in-aid finance the gap between the revenue generated by the schools and its total annual outlays. For private schools the grants are regarded as subsidies which are justified, in part, by MOE's control over private school tuition fees. These fees are always set equal to public school fees and reflect the view that since VHSs have traditionally served lower income groups, these groups should not be disadvantaged in access to a VHS if no public school is available.

1.18 The level of subsidy to private schools varies with their income but is in the range of 45-70%. Tuition fees for VHSs (W 150,000-441,600 p.a.) are often lower than fees for general high schools (W 220,800-441,600 p.a.) partly for the socio-economic reason of serving lower income groups, but also because the Government views vocational education as an economic investment while general education is regarded as an investment in the individual. Recognition that VHSs generally serve lower income groups is also reflected in the level of financial assistance awarded in the form of scholarships and fee exemptions. In 1989 about 31% of enrollments in VHSs received some form of financial assistance compared with about 17% of enrollments in general high schools. Assistance was the equivalent of 67% of the annual minimum tuition fee for a VHS student compared with 44% for a general high school counterpart.

1.19 Curricula. Standard curricula are prescribed by MOE for each type of VHS, both public and private. The structure of the different curricula vary but in general average about 35% for general, academic subjects, 50% for specialized, technical subjects and 15% for electives. The latter are work-related subjects which can be varied by the local boards of education according to skill needs in the local labor market. Practical experience is built into the curriculum in the form of the Supervised Occupational Program. This requires that all VHS students spend from one to six months in supervised occupational experience in their final year. The duration of the experience varies by type of school - one month for agriculture schools, three months for technical and commercial schools and six months for fisheries and marine schools. Apart from the valuable learning opportunity the period of practical experience provides, many contacts are made with employers which lead to employment offers on graduation. Relations between schools and employers are further strengthened through the Educational Committees for School - Industry Cooperation. In addition to being involved with organizing the supervised learning experience program, these committees assist in curriculum development and the exchange of employment information.

1.20 The VHS curricula are subject to major periodic reviews under the management of the Korea Educational Development Institute (KEDI). The fifth review was recently completed and revisions are currently being implemented. While the structure of the curricula remains largely unchanged following the review, some greater emphasis has been given to science and English and a data processing skills course has been introduced. The review process was rigorous and detailed and was undertaken in two parts. First, a study team of 270 teachers, academics and researchers reviewed the latest local and foreign research on curriculum development and then, through the use of questionnaires and visits to schools, examined the practical problems related to teaching the existing curricula. On the basis of these findings, a working group for curriculum revision comprising 453 members drawn from the schools, universities, research institutes and industry prepared draft revisions to the curricula. This process included visits to industry to obtain the views of employers on curricular issues. On completion of the revised curricula, revision of textbooks commenced and this exercise is expected to be completed by mid-1991. Textbook revision is carried out by KEDI assisted by consultants and the process is coordinated by MOE. Complementing these activities is the restructuring of the standard equipment list as described in more detail below (para. 1.22).

1.21 Equipment. Standard equipment lists for each specialization taught in the VHSs are available to each school. The lists represent the appropriate mix of types and numbers of equipment items necessary to teach the various curricula. None of the schools has been able to obtain 100% of the equipment in the standard lists. The three national VHSs come closest with 80-90% coverage but most schools are in the 40-60% range. In nearly all instances, the shortfall is in numbers of items rather than in the variety of equipment. The schools have responded by tightly scheduling the use of equipment and raising the numbers of students who can practice on particular items of equipment. This situation has led to efficient utilization rates for equipment but with some loss in the quality of learning because of crowding in the use of machines by students.

1.22 Periodic reviews of the standard lists, which accompany curricular revisions, follow a similar process to the latter. Revision follows two main steps--a basic study and survey of conditions in the schools followed by revision of the lists with appropriate inputs from industry. The present review of the lists is in its final stages and there is already clear evidence that they are becoming outdated. The review indicates that significant differences are emerging between the levels of sophistication of equipment used for training in the VHSs and those of equipment in use in the workplace. The discrepancies are due to the fact that equipment in the schools, has not been replaced and modernized fast enough to keep pace with the rapid changes in technology in recent years. Thus many items of equipment in the schools, in addition to being old and nearing the end of their useful lives, also bear little resemblance to the higher speed, greater precision and in many cases, automated equipment that VHS graduates encounter when entering the factory or office. Equipment to be financed under the proposed project would make a major contribution to updating equipment in selected schools to bring it closer in line with the needs of the workplace.

1.23 Arrangements for maintenance of equipment in the VHS system are generally satisfactory. All basic maintenance is conducted in the schools by the staff. Major repairs are carried out in the central Technical Repair Center (TRC) in Seoul. Teams from the TRC visit each school at about six monthly intervals to assist in the more complex maintenance tasks. Equipment in need of major repair which cannot be carried out in the schools is sent to the TRC in Seoul. To provide more effective service, maintenance staff are being increased at the TRC to enable school visits to be made every three months. The TRC is adequately funded by MOE and is receiving equipment financed by Japanese aid. In addition to repair work, the TRC also produces equipment maintenance manuals for the schools and conducts maintenance training for schools' staff.

1.24 Teachers. The vocational high schools in Korea have been able to attract well-qualified teachers in contrast to the common experience elsewhere. This is partly due to the relatively high prestige of teaching as a profession in Korea and also to relatively high salaries. The latter are not comparable to those in industry but the difference is not as large as is commonly found elsewhere. Classroom teachers of both vocational and general subjects are required to have a four-year degree plus additional units of pedagogy if they are not graduates of a school or faculty of education. At present, 35 universities and colleges are producing teacher candidates for the general subjects taught in VHSs and a mixture of 21 agricultural, engineering, fisheries and marine colleges are producing teachers for vocational subjects. Thus there is no shortage of candidates for teaching in the VHSs and recruitment is competitive. In 1989, 18,126 candidates applied for the 11,935 available teaching positions. Laboratory and workshop teachers are trained in two-year junior technical colleges and are classified as assistant teachers. However, practical teaching is not the sole preserve of assistant teachers - in schools where they are not on staff, the vocational subject teachers handle practical instruction.

1.25 In terms of total staffing, the level is reasonable with an overall student/staff ratio of 25:1. However, the endowment of teachers for vocational courses is less satisfactory, averaging over 40:1. Although general subjects account for only about 35% of the curriculum, the teachers of these subjects comprise 52% of the total teacher stock. Although this is only a rough indicator, it does suggest that some teacher resources could be reallocated in favor of vocational subjects. Teachers are well qualified, with 91% having at least a bachelor's degree or equivalent. They are also highly experienced with nearly 50% having over 10 years experience. Vocational teachers, whose background is largely pedagogical rather than industrial, spend periods in industry under the provisions of the Institutional Cooperation Act. There are also provisions under the Act for specialists in industry to hold appointments as part-time lecturers in the schools. In-service teacher training is widespread and focusses mainly on upgrading skills for promotion. Courses are held during semester breaks in local universities and colleges.

1.26 Employment of Graduates. On completion of the three-year VHS course, graduates sit for a certification test for Class II Craftsman administered by the Ministry of Labor. Pass rates are around 75% which, although lower than those for VTI graduates, nevertheless represent a

satisfactory achievement given the structure and objectives of VHS courses which are to produce both educated and skilled individuals. Since employment levels for VHS graduates are higher than the skill test rates, employers are clearly prepared to recruit some VHS graduates even without skill certification. In 1989, the status of about 91% of graduates for that year was identified, totalling about 237,000 graduates. Of this number, 10% entered higher education, 82% were employed, 7% were unemployed and the remainder entered military service. This represents a clear improvement over 1982 when only 58% were employed and 21% unemployed. However, 1982 was a recession year in the economy and this emphasizes the sensitivity of employment prospects for VHS graduates to overall economic conditions.

1.27 Future prospects for the employment of VHS graduates are somewhat unclear. As noted previously (para. 1.3), enrollments were declining in the late eighties in response, a least in part, to the changing structure of the labor market which was demanding higher skill levels as industry and commerce become more technology intensive. However, employers in the industrial and services sectors are now claiming that they are facing significant shortages of skilled craftsmen. The Government has responded with a plan for the long term expansion of VHS enrollments to achieve an enrollment ratio of 50:50 between vocational and general high schools, compared with the current ratio of 36:64 in favor of the general high schools. To achieve this by 2000 would require a VHS enrollment of about 1.05 million in that year, an increase of 215,000 in annual enrollments over the 1989 level. No projections of the demand for skills are available so it is difficult to assess whether the additional graduates would find employment. However, it is likely that the Government would begin to reduce the rate of increase in enrollments if significant unemployment emerged. Alternatively, if rising unemployment were to eventuate, the growth of VHS enrollments could be self-regulating as students switched from vocational to general high schools with the hope of entering higher education as an alternative to entering the labor market. The above issues would need careful analysis in any Bank-financed follow-up operation in vocational education.

D. Bank's Role in Education

1.28 The Bank has assisted Korea's technology development efforts through substantial support for the development of technical and scientific education and research.4/ Bank lending has been consistent with Korea's needs and priorities in education and has closely paralleled the increasing sophistication of Korean industry. It was recognized that the restructuring of industry towards more skill-intensive, high-technology production would require the continuous expansion and upgrading of technical skills. Thus as industry developed towards greater skill-intensiveness, Bank assistance to education moved from support for craftsman and technician training through professional

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4/ The Bank has also provided major support to technology development through directly financing R&D programs, strengthening intermediaries which finance R&D and providing credit for industrial development in general.

engineering education to graduate engineering programs and associated research activities.

1.29 The Bank's initial involvement in the sector under four loans/credits, focussed on the development of vocational and technical education at the secondary and post-secondary levels to strengthen the base of the system for producing technical personnel. Project performance audit reports (PPARs) for these projects concluded that they were in general well-conceived and successfully implemented. The first education project in Korea (Cr. 151-KO) supported the expansion of vocational high schools, junior technical colleges and teacher training. It also financed technical assistance and fellowships to strengthen the planning and administration of vocational and technical education. The PPAR for the loan (Report No. 1801-KO, November 22, 1977) concluded that physical implementation was satisfactory but that some delays were experienced in recruiting and utilizing the experts under the technical assistance component. The latter could have been overcome by more careful scheduling and a clearer definition of the experts' functions.

1.30 The second education project (Ln. 906/Cr. 394-KO) financed equipment for vocational high schools, junior technical colleges and undergraduate programs in science, engineering and education. The PPAR for the project (Report No. 4509, May 24, 1983) concluded that the project was implemented substantially as planned but with some delays due to over-optimistic scheduling. The third education project (Ln. 1096-KO) continued to support expansion and quality improvement in vocational high schools and junior colleges and for vocational training institutes under the Ministry of Labor. The project was implemented successfully and demonstrated the growing experience and competence of local project staff. The fourth education project (Ln. 1474-KO) supported a further expansion of VTIs and expansion and improvement of instructor training. The project completion report (PCR) for the project (Report No. 5516, March 8, 1985) concluded that the project was well designed, implemented efficiently and judged the project to be an excellent example of Bank/Borrower cooperation. It is reasonable to conclude that the first four projects demonstrated that the increased competence of local authorities led to improved project design and implementation. Project experience also demonstrated that there was a need to take a broader view of sectoral policies and issues after the implementation of four conventional projects. This was taken up in the two subsequent operations which were policy-oriented sector loans.

1.31 The first education sector loan (Ln. 1800-KO) concentrated on upgrading junior technical colleges and university colleges of engineering and management through the supply of equipment, staff development and institutional improvements in curriculum development, manpower planning, equipment maintenance and academic accreditation. The PPAR for the loan (Report No. 7252, May 24, 1988) indicates that the major lessons learned were: (a) a stable and responsible sector management agency was the key to successful implementation of the sector program; (b) the sector approach led to a quicker and more sustainable development of institutional capabilities; and (c) the additional time required for preparation was repaid in terms of more efficient implementation.

1.32 The second education sector loan (Ln. 2427-KO), which incorporated these lessons, assisted in supporting improvements in graduate education in science and engineering, upgrading secondary school and college science programs, expanding graduate research programs, improving sector management and manpower monitoring and strengthening the financial base of private educational institutions. Implementation of the loan was satisfactory and it closed on schedule (June 30, 1989) with its major policy objectives having been achieved. A PCR for the project is currently under preparation. The Bank's positive role in Korea's education sector is documented in the OED report titled Review of the Impact of World Bank Lending for Educational Development in Korea (Report No. 5950; December 4, 1985).

1.33 Following these education projects the Bank turned its attention to supporting research activities in the universities and the national research institutes under the first two technology advancement projects, although each contained a component assisting science and engineering education. Ln. 3037-KO assisted in improving the quality of science and engineering education at the Korea Institute of Technology, a center of excellence for the undergraduate teaching of gifted students in science and mathematics. Ln. 3202-KO supported quality improvement at the Korea Advanced Institute of Science and Technology, the leading graduate school in science and engineering.

II. THE PROJECT

A. Origin of the Project

2.1 The Government included the project in its FY91 list of projects suitable for external financing and formally asked the Bank for assistance in December 1989. Most of the preparation work was completed by the Government according to guidelines formulated by the Bank. The project was preappraised in February-March 1990 and appraised in June 1990.

B. Project Rationale, Objectives and Scope

2.2 The Bank has supported the development of technical and scientific personnel over the past two decades. In six operations, lending has paralleled Korea's technological development. Early lending focussed on vocational training for skilled craftsmen and technician training, and then shifted to support for undergraduate programs in engineering and science followed by assistance to graduate programs and research activities in these fields. Appropriate emphasis was also placed on improving the policy framework for technical and scientific training. The proposed project is reverting to assistance to vocational training in recognition of the need for the training system to keep pace with the demand for increasingly complex craftsman-level skills in the labor market. The craftsman occupies the base of the skill pyramid and the project is therefore helping to ensure that the system of technical training, which has contributed so much to Korea's industrial development, continues to have a strong foundation.

2.3 Through its long association with vocational and technical training in Korea, supported by recent sector work, the Bank has developed a significant comparative advantage in these fields. Bank assistance is still required

to fill gaps in investment programs of educational institutions which traditionally have relied on external financing to meet equipment upgrading needs. Moreover, the Bank's involvement in project design and appraisal brings value-added to the Ministry of Education through helping to strengthen its capabilities in these areas. The Bank brings continuity to the project development process and has developed criteria-based procedures and documentation which not only allow projects to be designed more efficiently, which benefits MOE, but which also may have wider application in the future as Korea becomes a donor supporting educational development elsewhere.

2.4 The overall objective of the project is to assist in upgrading the skill training provided in selected vocational high schools to ensure that their graduates continue to meet the increasingly complex skill requirements of industry, commerce, agriculture and fisheries. The project, to be carried out over a period of 5.5 years, would assist in making VHS graduates more productive upon entering employment and better able to adjust to changing technological processes. The project would finance specialized equipment through the proposed Bank loan and complementary inputs (O&M, consumables, etc.) to be financed by the Government.

C. Project Design and Description

2.5 The status of equipment provision in the vocational high schools is measured against standard equipment lists which vary in content among the different types of schools. The overall average provision for all schools is about 53% with the best equipped being the commercial schools (57%) and agriculture schools (57%), followed by technical (51%) and fisheries/marine schools (49%). These figures indicate that the VHSs are considerably below standard requirements in terms of equipment provision. However, the situation is not as serious as it appears. Equipment deficiencies tend not to be so much in terms of the range of equipment but rather in the numbers of items. Thus the range of equipment is reasonably consistent with the curricula to be taught but shortages of equipment items have led to the heavy scheduling of equipment use and above average numbers of students using equipment items for practice sessions. In a number of instances this has led to efficiencies gained from high utilization rates but in other cases excessive overscheduling has affected the quality of training. In addition, a number of equipment items are obsolete and need to be replaced in line with changing technology in the workplace (para. 1.22). The proposed loan of US$30 million would raise the overall average equipment provision to 63%, with commercial schools increasing to 66%, agricultural schools to 70%, technical schools to 57% 5/ and fisheries/marine schools to 78%.

5/ The relatively low increase in percentage provision for the technical schools does not reflect a lower priority but rather the fact that the technical schools' component is predominant in the overall standard equipment list for all VHSs. Although technical schools will be allocated 57% of loan proceeds, technical schools comprise 72% of the value of the overall standard equipment list.

2.6 The vocational high schools are under the overall control of the Ministry of Education but local administration is the responsibility of the provincial and city boards of education. Since the BEs are closest to the schools and therefore in the best position to understand their needs, they have been given the responsibility for selection of schools to participate in the proposed project. Each BE will select the schools to participate in the project mainly on the basis of the level of overall equipment provision in the schools, with the most disadvantaged being given priority. Account will also be taken in specific instances of newly-established departments which need to be equipped with basic items. Some attention will also be given to the need to improve equipment in particular departments in relation to newly-developing local industry, e.g., electronics departments in areas where the electronics industry is expanding. Equipment for each school would be procured partly to meet some of the shortfall in standard equipment items and partly for updated equipment needed to teach more advanced technologies. The proportions would vary according to the needs of each school. Both public and private schools would have equal opportunities for participating in the project. During negotiations, the Government gave assurances that schools would be selected for participation in the project according to criteria acceptable to the Bank.

2.7 To ensure that equipment to be procured under the project reflects overall development priorities and their regional implications, the Education Facilities Bureau (EFB) of MOE has established an advisory committee comprising officials and outside experts which would assist in determining priority fields of study for each BE. On the basis of this committee's recommendations, EFB will allocate specific amounts of the loan proceeds to each BE for specific types of vocational schools. Consequently, each BE will receive from EFB a specific allocation of loan funds and identified priority fields of study in which the funds will be spent. The BE will select the schools to participate in the project according to the criteria mentioned above.

2.8 Each BE will form a committee of experts for each type of school to assist it in determining how the loan funds allocated to it will be disbursed among the schools. Members of this committee will visit each school to assess the status of equipment in each selected school and, together with school authorities, will prepare a final list of equipment to be procured for each project school within the guidelines regarding fields of study.6/ The Education Loan Projects Division of EFB, which is responsible for implementation of the project (para. 3.7), will forward specifications for standard items of

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6/ The process of selecting items of equipment to be financed under the project will be facilitated by the fact that schools have already identified their equipment needs as part of a survey of all vocational schools. These lists have been passed through the BEs to MOE where they have been reviewed by the Education Loan Projects Division (ELPD), assisted by the Vocational Education Division and outside consultants, to determine priorities for equipment items in relation to curricula. Thus each school selected under the project will already have a prioritized list of equipment needs and each BE's committee of experts will review these priorities in terms of the guidelines regarding fields of study (provided by EFB).

equipment to each BE, as required, and will either review or prepare specifications for the more modern items of equipment not included in the standard lists of equipment at present. Each BE will group the equipment lists from the project schools for competitive bidding and will forward these packages directly to OSROK for procurement, with copies to ELPD. These procedures are represented diagrammatically in Annex 6.

2.9 The amount of equipment to be financed by the loan (US$30 million including contingencies) has already been determined by the Government and represents a fixed amount within the foreign borrowing program. The equipment forms the core of the project but in order to ensure that it is utilized effectively, complementary inputs must also be supplied. These would be financed by the Government and cover transportation and installation of equipment, O&M and consumable materials. The Government would also finance contingencies related to these components. Bank-financed equipment would be concentrated in four types of vocational schools - technical (US$17.1 million including contingencies), commercial (US$7.2 million), agricultural (US$4.3 million) and fisheries/marine (US$1.4 million). This investment represents assistance to a wide range of priority skill areas and would make a substantial contribution to modernizing the school's equipment and thereby strengthen the quality and relevance of vocational training.

III. PROJECT COSTS, FINANCING AND IMPLEMENTATION

A. Costs

3.1 The total cost of the project is estimated at US$43.3 million equivalent net of duties and taxes. The estimated cost by project component is summarized in Table 3.1 and by category of expenditure in Table 3.2. Detailed costs by component and category are given in Annex 7 and project expenditure by year and recipient in Annex 8.

Table 3.1: SUMMARY OF PROJECT COSTS BY COMPONENT

	Won Billion			US$ Million			Foreign as % of Total
	Local	Foreign	Total	Local	Foreign	Total	
Technical Schools	3.8	11.2	15.0	5.4	15.8	21.2	75
Commercial Schools	1.6	4.7	6.3	2.2	6.6	8.8	75
Agricultural Schools	0.9	2.7	3.6	1.3	3.8	5.1	75
Fisheries Schools	0.3	1.0	1.3	0.4	1.3	1.7	76
Baseline cost	6.6	19.6	26.2	9.3	27.5	36.8	75
Contingencies							
Physical	0.3	1.0	1.3	0.5	1.4	1.9	75
Price increase	1.4	1.9	3.3	1.9	2.7	4.6	59
Subtotal	1.7	2.9	4.6	2.4	4.1	6.5	63
Total Project Cost /a	8.3	22.5	30.8	11.7	31.6	43.3	73

/a Does not include duties, taxes and fees estimated at US$2.3 million.

Table 3.2: SUMMARY OF PROJECT COSTS BY CATEGORY OF EXPENDITURE

	Won Billion			US$ Million			Foreign as % of Total
	Local	Foreign	Total	Local	Foreign	Total	
Equipment	-	18.9	18.9	-	26.6	26.6	100
Equipment transportation and installation	1.0	0.1	1.1	1.5	0.1	1.6	10
Operations and maintenance	2.8	0.3	3.1	3.9	0.4	4.3	10
Consumable materials	2.8	0.3	3.1	3.9	0.4	4.3	10
Baseline cost	6.6	19.6	26.2	9.3	27.5	36.8	75
Contingencies							
Physical	0.3	1.0	1.3	0.5	1.4	1.9	75
Price increase	1.4	1.9	3.3	1.9	2.7	4.6	59
Subtotal	1.7	2.9	4.6	2.4	4.1	6.5	63
Total project cost	8.3	22.5	30.8	11.7	31.6	43.3	73

3.2 Base costs are estimated at February 1991 prices. Equipment costs are estimated on the basis of master lists already drawn up and recent catalogue prices. Transportation and installation costs, the initial supply of consum-ables and the costs of operations and maintenance are based on recent experience in the VHS system. Duties and taxes, allowing for exemptions, are estimated at US$2.3 million.

3.3 The contingency allowance of US$6.5 million (about 18% of baseline costs) includes contingencies for unforeseen physical conditions and for estimated price increases. Physical contingencies were estimated at 5% of baseline costs for equipment, transportation and installation of equipment, consumable materials and O&M expenditures. Price increase contingencies were calculated for both local and foreign costs in accordance with the following expected annual average price increase percentages: foreign cost, 3.6% in FY91 and thereafter and local cost, 5.0% p.a. throughout. Accordingly, aggregated price increases are estimated at about 12% of baseline costs plus physical contingencies.

3.4 The foreign exchange component of US$31.6 million (about 73% of total estimated project costs) has been calculated on the basis of the following foreign exchange percentages: equipment - 100%, transportation and installation - 10%, consumables - 10%, and O&M - 10%.

B. Financing

3.5 The proposed loan of US$30.0 million equivalent would finance about 95% of the estimated foreign exchange cost of the project or about 69% of total project costs net of duties and taxes. The Government would be responsible for the remaining 31% or US$13.3 million equivalent. The loan amount is limited to US$30.0 million by the foreign borrowing program and is therefore less than the foreign exchange cost of the project. The loan would finance 100% of the baseline cost of equipment plus all contingencies related to the equipment. Private schools participating in the project would not be required to repay loan funds but would receive such funds as budget transfers from MOE through the local boards of education.

Table 3.3: FINANCING PLAN

Category of Expenditure	Government	IBRD	Total
	----------US$ million----------		
Equipment	-	26.6	26.6
Equipment transportation and installation	1.6	-	1.6
Operations and maintenance	4.3	-	4.3
Consumable materials	4.3	-	4.3
Contingencies	3.1	3.4	6.5
Total	13.3	30.0	43.3

Recurrent Expenditures

3.6 When fully operational, the project would generate recurrent costs for consumable materials and O&M estimated at US$2.4 million p.a. This would be spread over approximately 300 schools thus averaging about US$8,000 per institution. These additional expenditures could be accommodated by the institutions without difficulty.

C. Project Management and Implementation

3.7 Overall responsibility for project implementation would lie with the Education Facilities Bureau of MOE - an agency that has gained considerable experience in implementing Bank projects through its responsibility for earlier Bank operations including the two education sector loans. Physical aspects of the project would be handled within EFB by the Education Loan Projects Division including relations with OSROK for equipment procurement. Assistance on educational issues would be provided by the Vocational Education Division (VED) of the Science and Technology Education Bureau of MOE. These bodies are adequately staffed with qualified and experienced personnel. An

organization chart for MOE is given at Annex 4. The project implementation schedule is shown in Annex 9.

3.8 The Education Loan Projects Division would be responsible for routine correspondence and reporting to the Bank, and for financial and disbursement matters. ELPD has played this role in previous Bank projects and is staffed with experienced procurement personnel. However, the bulk of the work in equipment procurement would be undertaken by OSROK, which is also highly experienced in procuring equipment under the Bank's international competitive bidding (ICB) procedures. On the basis of equipment lists and specifications provided by the local boards of education, OSROK would prepare bidding documents, invite bids, evaluate them in conjunction with the BEs and make contract awards. The schools would be responsible for installation, initial testing and operation of the equipment, unless specified in the equipment contract that the supplier would perform this task. The schools, assisted by the Seoul Technical Repair Center if necessary, would also be responsible for maintenance and repair of the equipment including acquisition of spare parts, accessories and consumables, beyond the items and services initially supplied under the contract. The Bank would supervise the project twice yearly around March and September coinciding as far as possible with the preparation of the semi-annual progress reports (para. 3.14). Overall implementation issues would be handled by the task manager with technical aspects being the responsibility of a consultant technical educator.

Status of Project Preparation

3.9 The advanced stage of project preparation would allow implementation to commence immediately after loan signing. Criteria for the selection of schools to be included in the project have been prepared and are acceptable to the Bank (para. 2.6). Standard equipment lists have been updated and schools have identified their equipment needs. Procedures are in place for reviewing and finalizing these needs. Project management authorities have been identified and competent staff are available to handle implementation activities.

Procurement

3.10 Procurement arrangements are shown in Table 3.4. About 85% of the equipment would be procured on the basis of ICB procedures in accordance with the Bank's guidelines. Equipment items in contracts valued at less than US$200,000 may be procured through international or local shopping with an aggregate ceiling of US$4.5 million. Local equipment manufacturers would be extended a 15% preference margin, or the prevailing customs duties, whichever is the lower, on bid evaluation under ICB. Transportation, operations and maintenance costs on equipment would be financed by the Government under local procedures. Installation costs and costs of consumables, if not included in the equipment contracts, would also be financed by the Government.

Table 3.4: PROJECT EXPENDITURE BY PROCUREMENT CATEGORY

Category of expenditure	ICB	LCB	Other /a	N/A	Total cost including contingencies
			(US$ million)		
Equipment	25.5	-	4.5	-	30.0
	(25.5)		(4.5)		(30.0)
Equipment transportation and installation	-	-	-	1.9	1.9
				(0.0)	(0.0)
Operations and maintenance	-	-	-	5.7	5.7
				(0.0)	(0.0)
Consumable materials	-	-	-	5.7	5.7
				(0.0)	(0.0)
Total	25.5	-	4.5	13.3	43.3
	(25.5)	-	(4.5)	(0.0)	(30.0)

/a Includes international and local shopping.

Note: Figures in parentheses are the amounts to be financed by the loan.

3.11 In accordance with successful practices for procurement under ICB used in recent education and technology advancement projects in Korea, OSROK would not be required to refer equipment contracts to the Bank for prior review before making contract awards. However, complete bidding documents including commercial terms, schedules of requirements and technical specifications would be sent to the Bank for reference and record before each invitation to bid. Bid evaluation reports, documents and contracts would be retained by OSROK for ex-post review by Bank missions.

Disbursements

3.12 The proposed loan of US$30.0 million would be disbursed over a period of 5.5 years (Annex 10). This corresponds to the standard disbursement profile for education projects in Korea which is 5.5 years. The completion date of the project would be December 31, 1995 and the closing date June 30, 1996. Disbursements would be made on the basis of (a) 100% of foreign expenditures for imported equipment or, 100% of local expenditures (ex-factory cost) for locally manufactured equipment; and (b) 65% of local expenditures for other equipment items procured locally. All reimbursement would be made against statements of expenditure for which full supporting documentation would be retained in MOE, for review as requested, by visiting Bank missions. Administrative and accounting capability in MOE is adequate to support the SOE procedure.

3.13 To facilitate disbursements, a special account, maintained in US dollars, would be set up at the Korea Exchange Bank in an amount of US$2.0

million, to cover the estimated average amount required to finance project expenditures for the next four months. Applications for replenishment of the special account would be submitted to the Bank on a quarterly basis or whenever the amount requested exceeds 50% of the initial deposit, whichever comes first.

Accounts, Audits and Reporting

3.14 MOE would maintain project accounts in accordance with sound accounting practices. During negotiations, the Government gave assurances that audited accounts and financial statements would be sent to the Bank within six months of the end of the financial year. The Government would submit semi-annual progress reports to the Bank in about March and September, provide status reports for visiting missions and, within six months of the closing date, submit Part II of the project completion report.

D. Environmental Impact

3.15 The project will not have any negative impact on the environment. The equipment to be supplied under the project will be located in properly designed workshops which operate under standard safety procedures.

E. Impact on Women

3.16 The project would have its strongest impact on women through the provision of equipment to support educational improvements in the commercial schools. Although girls comprise 52% of enrollments in the VHS system, they account for 79% of enrollments in the commercial schools (Table 1.1). This reflects the traditional preference of girls for office-related rather than factory-related work. No discriminatory practices exist which would discourage females from enrolling in industrial skills courses and the present enrollment pattern is largely the result of the exercise of individual preferences. High female enrollment in the commercial schools reflects the continued shift of women into better paying jobs in the economic mainstream. The project would contribute to producing better-trained female workers for the service sector.

IV. BENEFITS AND RISKS

A. Benefits

4.1 The project would provide selected vocational high schools with modern equipment which would be more closely attuned to the increasingly complex equipment utilized in the industrial, commercial, agricultural, and fisheries sectors. This would result in improved training which would enhance the value of vocational high school graduates to prospective employers by increasing their usefulness immediately upon graduation and by improving their ability to adjust to technological change in the workplace. Thus, the continued employability of vocational high school graduates would be assured, and the productivity of the sectors in which the graduates were employed would be enhanced.

B. Risks

4.2 There are no major risks associated with the project.

V. AGREEMENTS REACHED AND RECOMMENDATION

5.1 Government has agreed to the following:

(a) schools would be selected to participate in the project according to criteria acceptable to the Bank (para. 2.6)

(b) audit reports would be submitted by the Government to the Bank within six months of the end of each financial year (para. 3.14);

(c) within six months of the Closing Date, Part II of the project completion report would be submitted to the Bank (para. 3.14).

5.2 Subject to the above conditions, the project constitutes a suitable basis for a Bank loan of US$30.0 million equivalent to the Republic of Korea for a term of 15 years, including 5 years of grace at the Bank's standard variable interest rate.

ANNEX 1

KOREA

VOCATIONAL EDUCATION PROJECT

Structure of Craftsman Training in Vocational Training Institutes
(1989)

Training Agency	No. of Training Centers	Output of Trainees
Public Sector		
KVTMA	33	15,620
Central Government	37	4,998
Local Government	4	1,490
Subtotal	74	22,108
Private Sector		
In-plant	107	16,278
Authorized	80	19,542
Subtotal	187	35,820
Total	261	57,928

ANNEX 2

KOREA

VOCATIONAL EDUCATION PROJECT

Output of Trained Craftsmen from Vocational Institutes

Industry	Output of Trainees			
	1989		1977-81	
	No.	%	No.	%
Metal materials and manufacturing	1,234	2	19,530	4
Metal processing	17,745	31	96,506	19
Transportation and construction equipment	10,205	18	67,827	14
Electricity	3,681	6	19,114	4
Electronics and communicatins	6,197	11	28,708	6
Textiles	3,634	6	110,381	22
Wood processing	3,266	5	88,464	18
Chemistry	1,275	2	22,986	5
Printing	90	-	6,809	1
Mining	77	-	9,989	2
Handicrafts	682	2	4,527	1
Food Processing	719	1	9,289	2
Other	9,123	16	11,609	2
Total	57,928	100	495,739	100

ANNEX 3

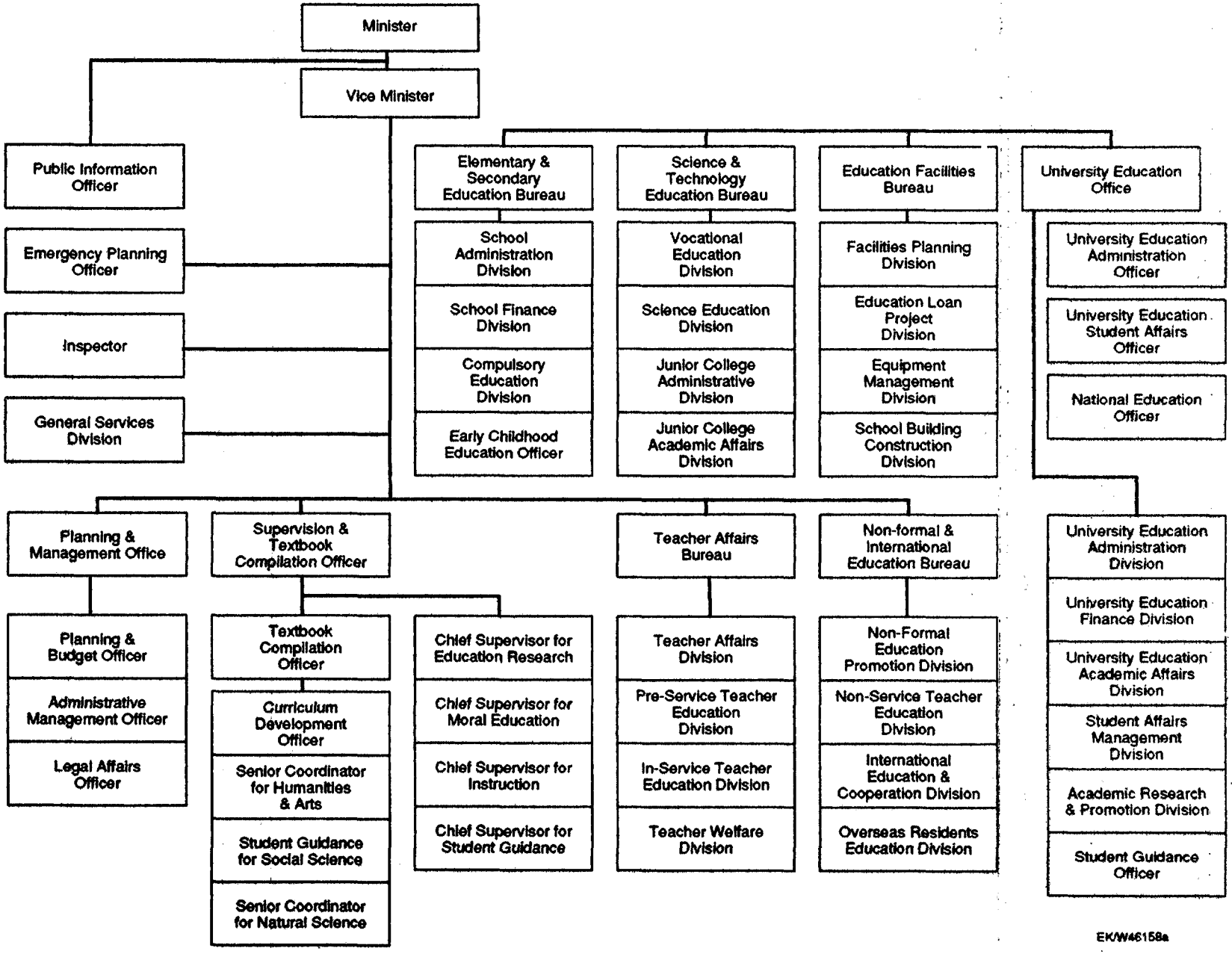
KOREA

VOCATIONAL EDUCATION PROJECT

ENROLLMENTS BY COURSE IN VOCATIONAL HIGH SCHOOLS - 1989

Course	Enrollments ('000) Total	Female	% Female
Agriculture			
Agriculture	12.0	0.6	5.0
Horticulture	11.7	3.7	3.2
Zootechnology	13.6	0.2	1.5
Forestry	3.4	0.1	2.9
Agricultural Eng.	4.6	-	-
Other	8.1	1.3	16.0
Sub-total	53.4	5.9	11.0
Industry			
Machinery	62.2	-	-
Electricity	31.4	-	-
Electronics	26.8	0.8	3.0
Chemical Eng.	14.2	0.4	2.8
Communications	3.4	0.2	5.9
Plumbing/Welding	3.8	-	-
Automobile	3.2	-	-
Architecture	19.5	0.5	5.3
Civil Eng.	18.3	-	-
Other	19.2	0.7	3.6
Sub-total	202.0	2.6	1.3
Commerce			
Commerce	336.9	270.2	80.2
Information Proc.	65.8	53.3	81.0
Accounting	48.6	39.3	80.9
General	98.7	50.5	51.2
Other	15.4	10.6	68.8
Sub-total	565.4	423.9	75.0
Fisheries and Marine			
Engine	3.5	-	-
Fishing	2.1	-	-
Communications	1.6	-	-
Navigation	1.1	-	-
Other	2.5	0.2	8.0
Subtotal	10.8	0.2	1.9
Miscellaneous	3.6	2.3	63.9
Total	835.2	434.9	52.1

KOREA
VOCATIONAL EDUCATION PROJECT
Organization of the Ministry of Education



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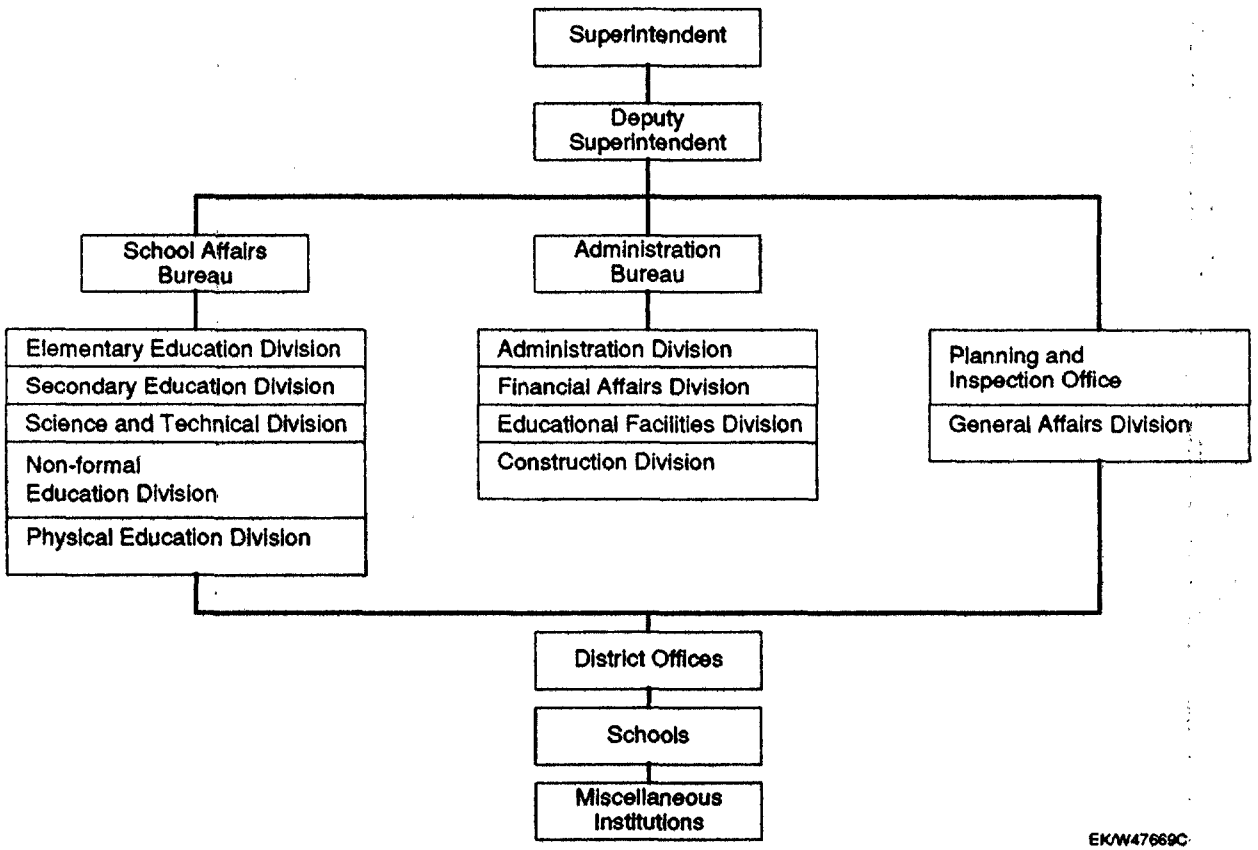
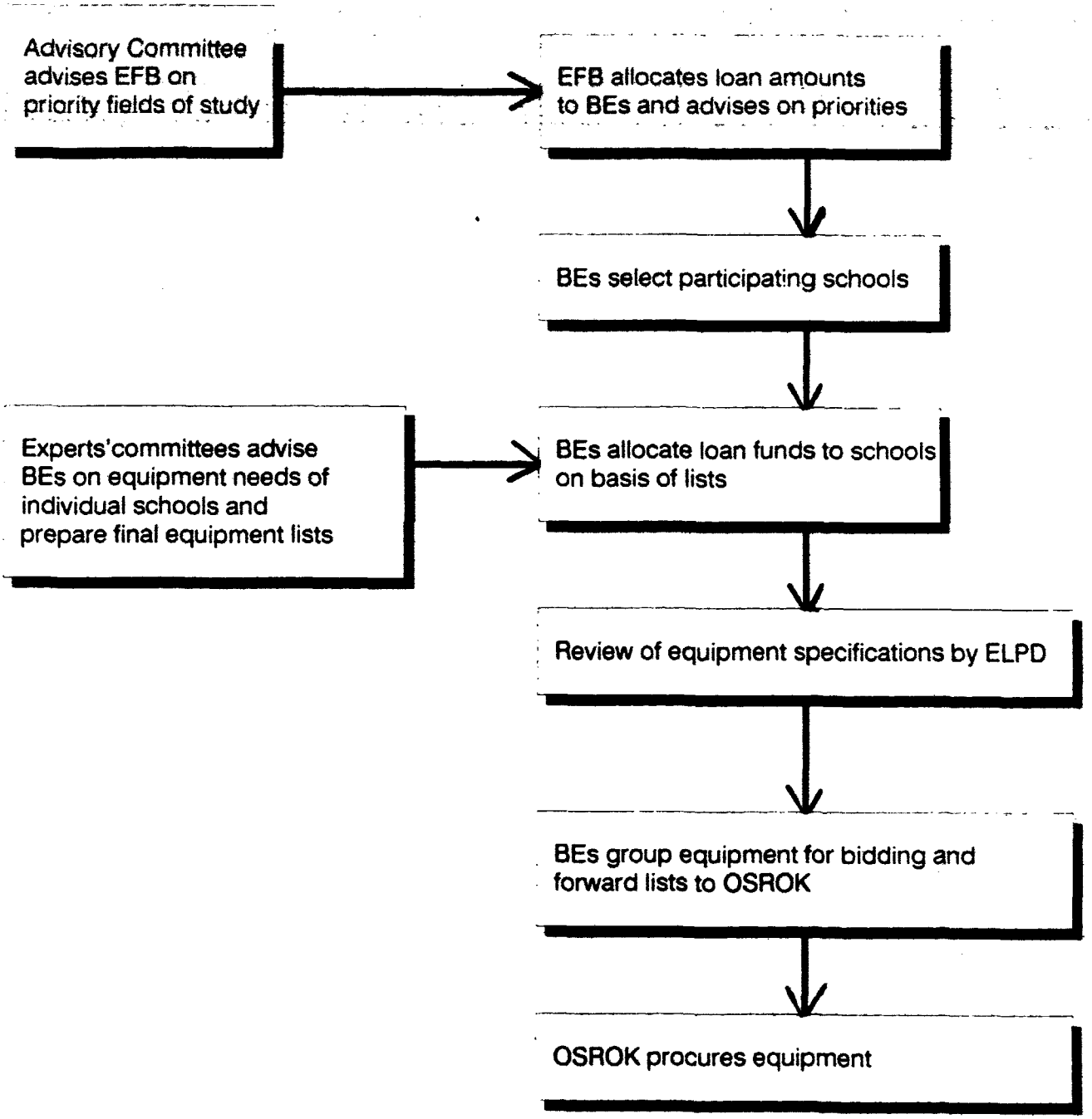
ANNEX 4

KOREA
VOCATIONAL EDUCATION PROJECT
Organization of a Board of Education



ANNEX 6

KOREA
VOCATIONAL EDUCATION PROJECT
Procedures for Equipment Procurement



KOREA

VOCATIONAL EDUCATION PROJECT

Detailed Project Costs
(Won million)

	Equipment	Equipment Transportation and Installation	O & M	Consumable Materials	Total Cost Won M	Total Cost US$ M
Technical Schools	10792	653	1803	1803	15051	21.2
Commercial Schools	4544	277	738	738	6297	8.8
Agricultural Schools	2627	156	426	426	3635	5.1
Fisheries/Marine Schools	923	57	142	142	1264	1.7
Baseline Cost	18886	1143	3109	3109	26247	36.8
Contingencies						
Physical	944	57	156	156	1313	1.9
Price Increase	1478	148	804	804	3234	4.6
Subtotal Contingencies	2422	205	960	960	4547	6.5
Total Project Cost						
Won million	21308	1348	4069	4069	30794	
US$ million	30.0	1.9	5.7	5.7		43.3

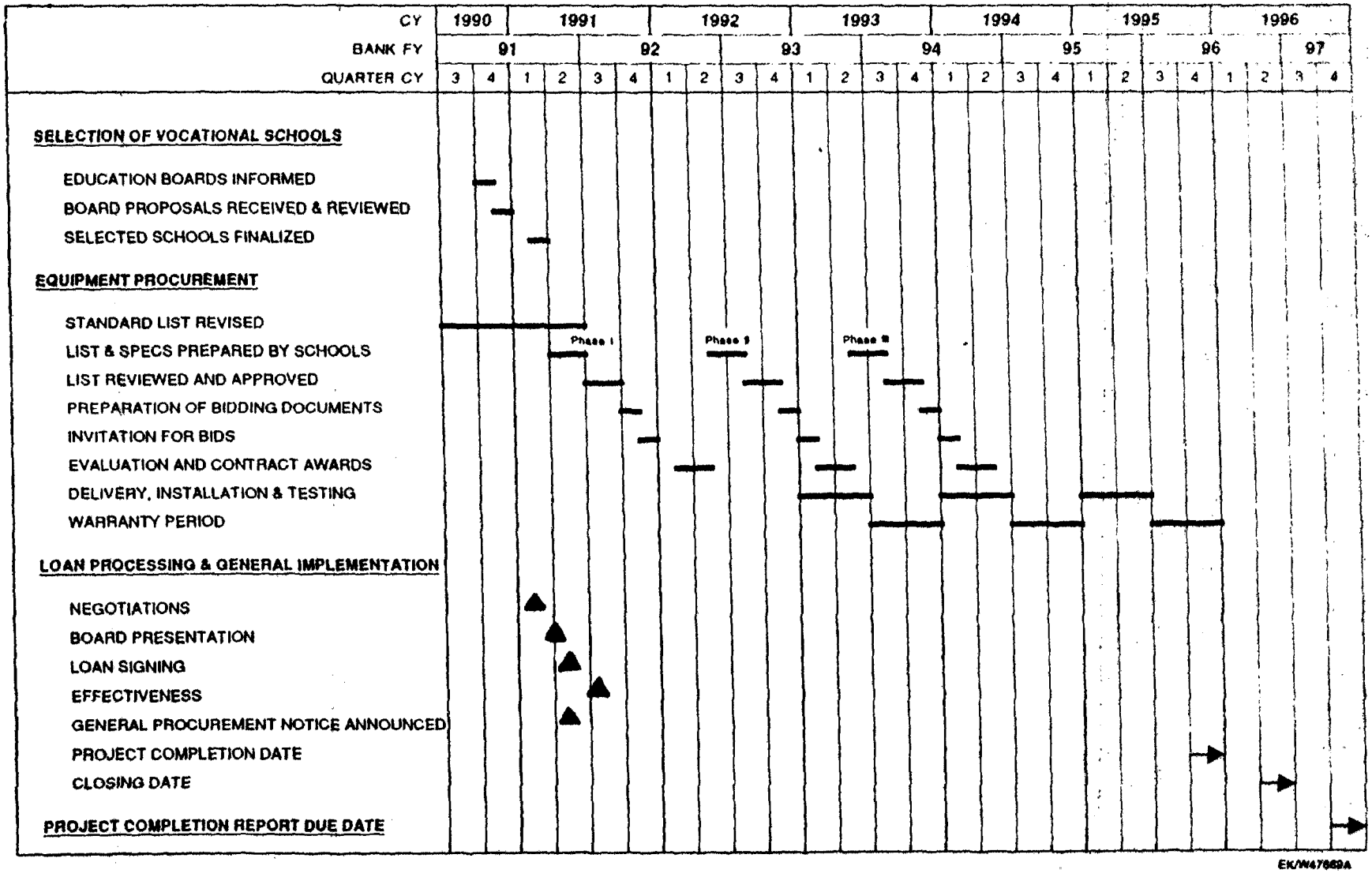
KOREA

VOCATIONAL EDUCATION PROJECT

Project Expenditure by Year and Receipient

	Base Costs (Won million)						Total Cost	
	91/92	92/93	93/94	94/95	95/96	96/97	Won M	US$M
Technical Schools	902	4,118	4,402	3,067	1,456	1,106	15,051	21.2
Commercial Schools	312	1,725	1,853	1,321	582	504	6,297	8.8
Agricultural Schools	241	987	1,058	710	348	291	3,635	5.1
Fisheries/Marine Schools	92	327	341	284	149	71	1,264	1.7
Baseline Cost	1,547	7,157	7,654	5,382	2,535	1,972	26,247	36.8
Contingencies								
Physical	77	358	383	269	127	99	1,313	1.9
Price Increase	31	431	797	829	566	580	3,234	4.6
Total Project Cost	1,655	7,946	8,834	6,480	3,228	2,651	30,794	43.3
Foreign Exchange	1,463	6,949	7,256	4,665	1,414	741	22,488	31.6

KOREA
VOCATIONAL EDUCATION PROJECT
IMPLEMENTATION SCHEDULE



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ANNEX 9

ANNEX 10

KOREA

VOCATIONAL EDUCATION PROJECT

Disbursements

IBRD Fiscal Year and Semester	Disbursements			Disbursements Profile /a
	Semester	Cumulative	as % of Total	(%)
	--------US$----------			
1992				
1	2.0 /b	2.0	6.7	1
2	0.0	2.0	6.7	3
1993				
1	4.0	6.0	20.0	5
2	6.0	12.0	40.0	10
1994				
1	4.0	16.0	53.3	23
2	6.0	22.0	73.3	44
1995				
1	4.0	26.0	86.7	70
2	2.0	28.0	93.3	81
1996				
1	1.0	29.0	96.7	92
2	0.5	29.5	98.3	97
1997				
1	0.5	30.0	100.0	100

/a Standard disbursement profile for education projects in Korea.

/b Initial deposit in Special Account.

KOREA

VOCATIONAL EDUCATION PROJECT

Selected Documents Available in the Project File

A. Reports and Studies Related to the Sector/Subsector

A-1* Introduction to Science and Technology - Republic of Korea, MOST, 1988.

A-2* Korea - Sector Survey of Science Education, IBRD, January 12, 1982.

A-3* Impact of World Bank Lending for Educational Development in Korea: A Review, IBRD Report No. 5950, December 5, 1985.

A-4 Lee, Kye-Woo, Human Resources Planning in the Republic of Korea, World Bank Staff Working Papers No. 554, 1983.

A-5 Chang, Suk-Min, Challenges of Technological Changes on Technical Education, 1983.

A-6 Lee, Chingboon, Financing Technical Education in LDCs: Economic Implications from a Survey of Training Modes in the Republic of Korea, Discussion Paper, Education and Training Series, World Bank, September 1985.

A-7 The Korean Labor Market: Emerging Policy Issues, IBRD Report No. 6478-KO, February 2, 1987.

A-8 Rutters, Klaus, Vocational Education in Korea, GTZ, August 1988.

A-9 Lee, Sang-Joe, The Development History of Vocational Training Policies in Korea, KVTMA, September 1988.

A-10 Vocational Training in Korea, Ministry of Labor, ROK, 1989.

A-11 Linkages between the Macroeconomic Environment and Vocational Education and Training: A Case Study of the Republic of Korea, IBRD, undated.

A-12 Shin, Se Ho and Ihm, Chon Sun, Vocational Education System in Korea: A Narrative on Historical Development, September 1988.

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* - See Project File for the First Technology Advancement Project (Loan 3037-KO).

B. Reports and Studies Related to the Project

B-1 Vocational High Schools Equipment Expansion Project, MOE, May 1990.

B-2 The School Curriculum of the Republic of Korea, MOE, undated.

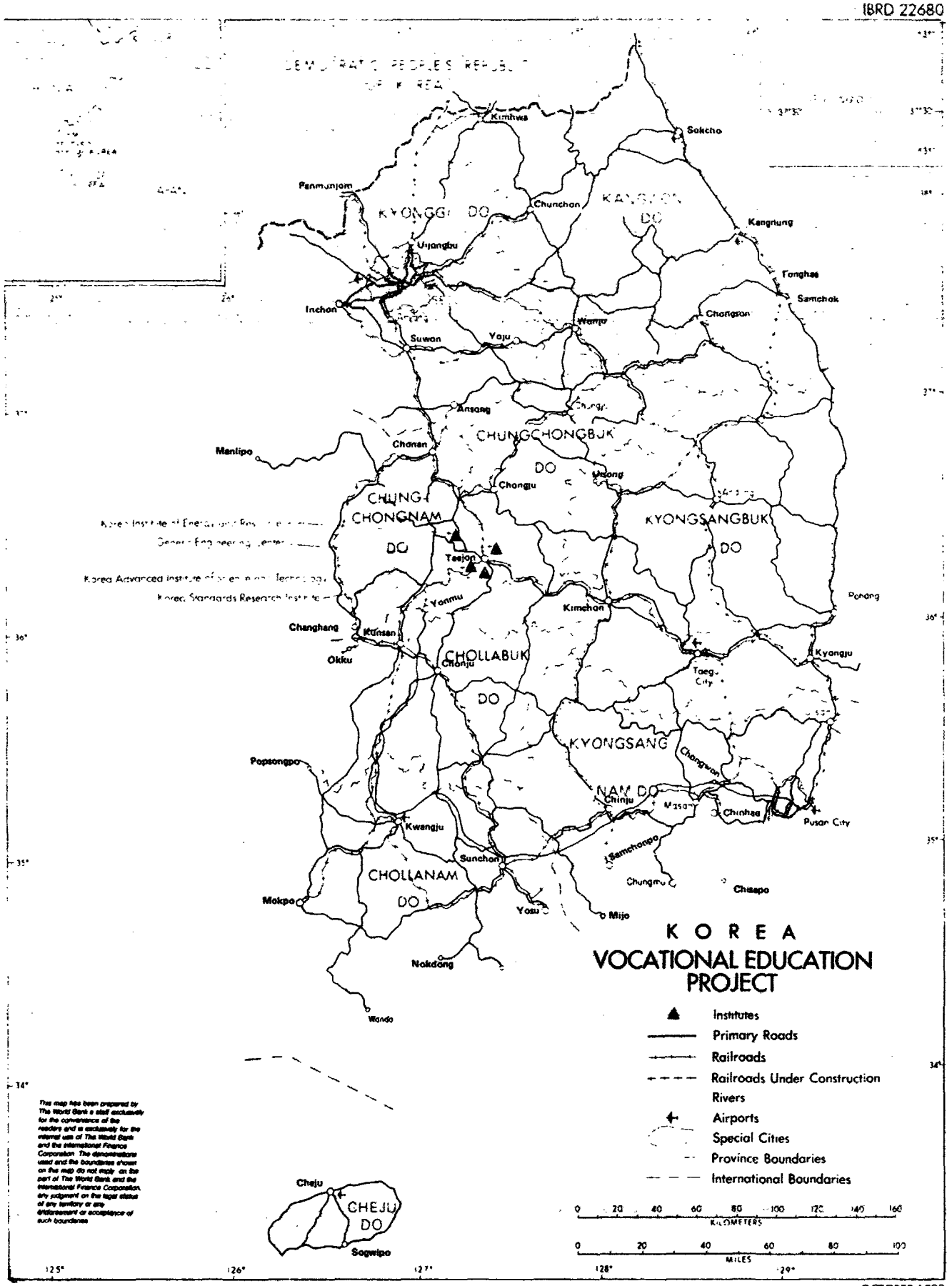
C. Selected Working Papers

C-1 IBRD Working Paper - Equipment

C-2 IBRD Working Paper - Improvement of the Vocational Education System in Korea.

MAP SECTION

IBRD 22680



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